

Mathematics 152 A

Calculus II

Spring 2016

Instructor

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Office Hours

Mon	Tue	Wed	Thu	Fri
9:00-10:00	9:00-9:30	9:00-10:00	9:00-12:00	9:00-10:00
	10:30-12:00		1:15-3:00	
	1:15-2:00			

If office hours cannot be held for any reason, a note will be posted on the office door.

Instructor

My name is Henry Suters and I have been teaching at Carson-Newman since 1994. I have a Ph.D. in Mathematics from Duke University and an M.S. in Computer Science from the University of Tennessee. I am married and have three children (triplets, almost 11 years old, two girls and a boy).

Objectives

This is a first year course in single-variable calculus, the second of the four courses in the calculus sequence. It is primarily intended for science, pre-engineering and mathematics majors, covering integral calculus and its applications.

Mathematics without calculus is limited to situations where important parts of the problem are either static or change in very restricted ways. However, with the development of the calculus integral, we can describe quantities that are continually changing. We can also find lengths, areas, and volumes of irregular shapes.

The material for this course will come from chapters 4-7 of the book. We will develop the following topics: integrals, inverse and transcendental functions, techniques of integration and applications of these topics.

In developing the tools to help accomplish this we will build on the mathematical skills from Calculus I; for some of you this may involve some review as well as new material.

This course meets Liberal Arts Objective 4a) of the college General Education requirements:

- When presented with an analytical problem, students will choose an appropriate

model with which to solve the problem, use quantitative techniques to arrive at a solution, and interpret their solution in writing.

In addition, at the end of the course, students should be able to meet the following learning objectives (these are only a selection of the objectives for the course). Students should be able to:

- Describe integrals in terms of areas
- Describe integrals in terms of antiderivatives
- Evaluate basic integrals
- State and interpret the Fundamental Theorem of Calculus
- Evaluate integrals using basic substitutions
- Identify which functions have inverses
- Use the natural logarithms and exponential functions
- Use inverse trigonometric functions
- Use l'Hopital's Rule
- Evaluate basic integrals using integration by parts
- Evaluate basic integrals using trigonometric substitutions
- Use partial fractions
- Evaluate basic improper integrals
- Set up and solve integrals using the disk and washer methods

Prerequisites

It is expected that students will have completed Calculus I (MATH 151) or equivalent before attempting this course.

Student Responsibilities

You are expected follow along with the lectures in class, to read the related sections in the book and to complete the homework before coming to class. It is your responsibility to get assistance if you have any difficulties with the material.

It is also your responsibility to be familiar with the course schedule and to complete the assignments, as they are due. Finally, you are expected to participate on group projects and make presentations to the class.

Throughout the course you will accumulate points toward your final grade. There will be several options you can select to accumulate points. It is your responsibility to keep track of your progress in the course and make sure you are accumulating sufficient points to meet your goals for the course.

Because of the cumulative nature of any mathematics course, you should complete assigned homework problems promptly. If you fall behind in this course it can be very difficult to catch up.

Instructor Responsibilities

I will attempt to answer questions about the course material and provide guidance on

projects. I will give prompt feedback for presentations. I will remind you of the due dates of assignments in class.

I will give individual assistance during my office hours, which are listed in this syllabus. If office hours must be cancelled for some reason, a note will be posted on the office door. If there is no note, and I am not present, it means I am performing some short errand and should be back soon.

I will grade assignments in a timely manner:

- Quizzes - by the next class period
- Exams - within two class meetings
- Projects - within two class meetings after the due date

I will respond to email requests within 24 hours during the week and 72 hours on weekends and holidays.

Textbook

Stewart, *Essential Calculus*, 2nd edition, 2013, ISBN-13: 978-1-133-11229-7.

The sections we plan to cover are:

4.2 The Definite Integral

4.3 Evaluating Definite Integrals

4.4 The Fundamental Theorem of Calculus

4.5 The Substitution Rule

5.1 Inverse Functions

5.2 The Natural Log Function

5.3 The Natural Exponential Function

5.4 General Logarithmic and Exponential Functions

5.5 Exponential Growth and Decay

5.6 Inverse Trigonometric Functions

5.8 Indeterminate Forms and l'Hopital's Rule

6.1 Integration by Parts

6.2 Trigonometric Integrals and Substitutions

6.3 Partial Fractions

6.6 Improper Integrals

7.1 Areas Between Curves

7.2 Volumes

7.3 Volumes of Cylindrical Shells

7.7 Differential Equations

Calculator

A graphing calculator is required for this course. The Texas Instruments family of graphing calculators is suggested (TI-83, TI-84, TI-89, or TI-Nspire). I will attempt to provide assistance in using specific calculators during office hours - bring the owner's manual.

Online Resources

A copy of this syllabus is available online in two locations: the first is the course page on C-N Online (<https://cnonline.cn.edu>) and the second is the course Wikispaces site (<http://cn-math152.wikispaces.com>). Other pages on this site include project and homework assignments. I am also available through the email address listed at the beginning of the syllabus.

Face-to-face Resources

The following options are available for students wishing to get assistance in the course.

- My office hours listed at the beginning of the syllabus.
- Tutoring will be available and a schedule of tutoring times will be posted when it is finalized.

If you are confused about any portion of the course, it is your responsibility to use either online resources or face-to-face resources to resolve the problem.

Point System

Your grade will be assigned using a point system. There are 1000 points possible in the course and you can accumulate points by taking tests and quizzes, by making class presentations and by completing various projects. The projects are all available on the "Projects" page of the Wikispaces site (<http://cn-math152.wikispaces.com/Projects>) and have due dates. They can be completed early but, unless other arrangements have been made in advance, must be turned in by the due date to receive credit. It is not necessary to take advantage of every opportunity to receive a good grade in the course. You will need to keep up with your point accumulation to make sure that you are on track to meet your goals. I will try to remind you of your progress at key points during the semester. Do not wait until too late in the semester to try to build up your point total.

The following are the opportunities that can be used to accumulate points. A description of each is included in this syllabus.

Assignment	Number Possible	Points (each)
Tests	2	100
Midterm	1	130
Final	1	160
Quizzes	16	10
Presentation Problems	5	10
Individual Projects	4	32
Group Projects	4	41
Course Evaluation	1	8

Your grade in the class will be based on the number of points you accumulate using the following table.

A:	765 - 1000
B:	680 – 764.5
C:	595 – 679.5
D:	510 – 594.5
F:	0 – 509.5

I reserve the right to adjust the grading criteria to meet any special circumstances during the course.

Homework and Quizzes

Homework problems will be assigned during the lectures. A list of homework assignments will also be maintained on the course Wikispaces site. After the homework has been assigned and you have had a chance to address any difficulties, there will be a quiz over the material from the homework assignment. You can earn up to 10 points on each quiz. The number you earn on each quiz will depend on your performance. The quizzes are given on an open-note/open-book basis. You are expected to copy your answer from the relevant homework problems. It is also expected that you have already completed these problems and that you already know the answers. Time on the quizzes will be limited to 5 minutes, so you may not have time to do all the problems from scratch. Again, it is expected that you already know the answer.

Tests

Some of your best opportunities to earn points will be the tests and exams. There will be two tests (up to 100 points each) in addition to a midterm (up to 130 points) and a final (up to 160 points). The midterm and final exam will be cumulative, covering all of the material covered up to that point in the course. The dates of these exams are listed in the course schedule.

For the two tests and the midterm exam you will be allowed to bring a 4 by 6 card with writing on one side. For the final exam you will be allowed writing on both sides. You are encouraged to bring a calculator for use on the tests. The following guidelines will apply to the calculators used on the test.

- It must be a dedicated calculator, not a cell phone or other multipurpose device.
- You are responsible for your own calculator.
- Sharing of calculators will not be allowed during tests.
- You should become familiar with the use of your calculator before the test because assistance in using calculators will not be provided during the test.
- I will not loan calculators to anyone during a test.

No other written material or electronic devices (cell phones, iPods, iPads, PDAs, etc.) will be allowed during the tests.

Presentation Problems

When the homework problems are assigned, I will ask for volunteers to present selected problems at the next class meeting. You can earn up to 10 points doing a presentation problem. The points will be assigned as follows:

- 10 – an excellent presentation
- 8 – some very minor problems (e.g. a lost negative)
- 6 – minor problems (e.g. method used incorrectly)
- 4 – serious problems (e.g. incorrect method used)
- 2 – unsuccessful attempt (e.g. problem not understood);
- 0 – no attempt

If you need help on a presentation problem, you are welcome to contact me for help, hints, and even answers (if it comes to that). Please do not agree to do a presentation on a day that you know you will not be present since this will prevent another student from having the opportunity to make a presentation on that problem. You can present at most 5 problems during the course.

Individual Projects

There is a list of suggested individual project descriptions on the course Wikispaces site (<http://cn-math152.wikispaces.com/Projects>). You are also welcome to propose your own topic for an individual project, but you must get my approval before you begin the project itself. You can complete at most 4 individual projects during the semester and they are worth up to 32 points each. You can begin these projects at any time but you must be complete them by the due date in the course schedule to receive credit. They are numbered according to the lecture with which they are most closely associated.

To receive credit for the project you will need to turn in a written report. This report should be typed and mathematical equations and expressions should be typeset. It does not need to be long but it does need to adequately address the assignment. Your grade on each group assignment will be based on the mathematical content of your report as well as the written quality of your report.

The **mathematical content of your report** will be graded on 16-point scale:

- 16 – The report successfully addresses the assignment
- 13 – The report has some minor problems; you adequately addressed the entire assignment but made some minor mistakes
- 10 – The report has some major problems; you understood most of the assignment but made some major mistakes.
- 7 – The report inadequately addresses the assignment; you understood some parts of the assignment but not others.
- 4 – The report does not address the assignment; you did not understand the assignment.
- 0 – No report.

The second factor is the **written quality of your report**. The project description may contain a numbered list of questions for you to answer, but your report needs to address these questions using complete sentences that explain your reasoning. Someone who has not read the initial description should be able to understand your report. This is important for two reasons: it is important to be able to discuss mathematical concepts in a coherent manner, and I can give you partial credit if I can understand your reasoning (even if the answer is wrong). I will not accept reports that are simply lists of answers to questions in the assignment.

In addition, the projects in the class will often involve a significant number of equations and other expressions using mathematical symbols. In order to include these in your reports in a professional manner, it will be necessary to use some tool to typeset your mathematical equations. The Equation Editor that is included with Microsoft Word is one good option. You should work to include your equations smoothly into your reports. Remember, mathematical symbols represent words. They can be used in sentences as if they were the words they represent.

This factor will also be graded on a 16-point scale:

- 16 – All answers include complete sentences and appropriate units along with a complete explanation of the reasoning used to arrive at the answer.
- 13– All the answers are presented in complete sentences with appropriate units but some reasoning is not adequately explained.
- 10 – Some but not all of the answers are presented in complete sentences and contain appropriate units.
- 7 – The answers contain appropriate units but not complete sentence or explanations
- 4 – The answers are given with no units or explanations.
- 0 – No report.

Group Projects

Group projects will be similar to individual projects except that they are more involved and must be done in groups on 2-4 students. Each student can participate in at most 4 group projects. The group projects are worth up to 41 points each and the points will be assigned in a manner similar to the individual projects. Each group member can earn up to 9 additional points based on their participation in the project. If you do not do your part you will not receive the points. It will be up to you to form your own groups and assign the roles for each individual in the group. You will also need to fill out and submit a project assessment sheet (available on Wikispaces) with your written report.

Class Disruptions

Please be considerate of others taking the course. You should only use cell phones in critical situations (e.g. you are the emergency contact for a child). In this case the phone should be set to vibrate and you should leave the room to take a call. Please do not use any other electronic distractions (e.g. mp3 players, text messaging, etc.) during class. You

should also refrain from unnecessary private conversations or conversations that are unrelated to the class.

Academic Honesty

Academic honesty is very important. Any form of cheating or the use of materials not specifically permitted on tests and quizzes will be dealt with according to the procedures in the student handbook. You are encouraged to work with other students, but only turn in your own work. In all cases, academic dishonesty will result in a score of 0 on the particular assignment involved.

Attendance

Attendance at all class meetings is required and you are responsible for all the work, including tests, quizzes and projects. If you must miss class, you need to account for your absence and arrange to obtain assignments for work missed in a timely manner. You will be allowed to make up class work missed only if the absence was caused by documented illness, or death of an immediate family member. You will also be allowed to make up class work missed because of participation in a college-sponsored activity only if arrangements have been made in advance.

Disabilities

If you have any special disabilities (sight, hearing, language, mobility, etc.), which may affect class activities, please let me know. In addition, please contact David Humphrey, Coordinator for Students with Disabilities, in the Kathleen Manley Wellness Center: office phone 865-471-3268; receptionist 865-471- 3350. I reserve the right to adjust the grading of students with special disabilities.

Support Services

For additional supportive resources for academic and personal well-being, please contact the Student Success Center in the Learning Commons (2nd floor of Stephen-Burnette Library) at 471-3567 and/or Counseling Services (Kathleen Manley Wellness Center) at 471-3350.

Schedule

The following is a schedule that specifies when you should begin reading the lectures. The schedule also indicates the dates for quizzes and tests and when projects are due. I will attempt to remind everyone of these assignments, but it is your responsibility to make sure that you are doing the assignments according to the schedule.

Date	Event	Lectures	Quizzes	Projects Due	Tests
Jan. 8	Class Begins				
Jan. 11		Section 4.2			
Jan. 13		Section 4.3			
Jan. 15			Quiz 1	Project 1	
Jan. 18	MLK Day	No Class			
Jan. 20		Section 4.4	Quiz 2		

Jan. 22					
Jan. 25		Section 4.5	Quiz 3	Project 2	
Jan. 27					
Jan. 29					Test 1
Feb. 1		Section 5.1			
Feb. 3		Section 5.2			
Feb. 5			Quiz 4		
Feb. 8		Section 5.3	Quiz 5		
Feb. 10				Project 3	
Feb. 12		Section 5.4	Quiz 6		
Feb. 15					
Feb. 17		Section 5.5	Quiz 7		
Feb. 19				Project 4	
Feb. 22		Section 5.6	Quiz 8		
Feb. 24					
Feb. 26		Section 5.8	Quiz 9		
Feb. 29					
Mar. 2					Midterm Exam
Mar. 4		Section 6.1			
Mar. 7	Spring Break	No Class			
Mar. 9	Spring Break	No Class			
Mar. 11	Spring Break	No Class			
Mar. 14					
Mar. 16		Section 6.2	Quiz 10		
Mar. 18				Project 5	
Mar. 21		Section 6.3	Quiz 11		
Mar. 23					
Mar. 25	Easter	No Class			
Mar. 28	Easter	No Class			
Mar. 30		Section 6.6	Quiz 12	Project 6	
Apr. 1					
Apr. 4					Test 3
Apr. 6	Research Day	No Class			
Apr. 8		Section 7.1			
Apr. 11					
Apr. 13		Section 7.2	Quiz 13		
Apr. 15				Project 7	
Apr. 18		Section 7.3	Quiz 14		
Apr. 20					
Apr. 22		Section 7.7	Quiz 15		
Apr. 25				Project 8	
Apr. 27	Class Ends		Quiz 16		
May 2 8:30-10:30 am					Final Exam

Disclaimer

This syllabus is the plan for the course. I reserve the right to make changes and adjustments if they prove necessary as the course progresses. All of the policies and grading criteria in this syllabus are subject to change. I will notify you if any changes are necessary.

Student Information

What is your name? _____

E-mail _____

Address _____

Phone Number _____

Major (if decided) _____

What is your reason for taking this course?

What do you hope to learn in this course?

What previous mathematics courses have you taken?

Do you have any special disabilities (sight, hearing, language, mobility, etc.) that may affect class activities?
